

1,046,349.

Fig. 1.

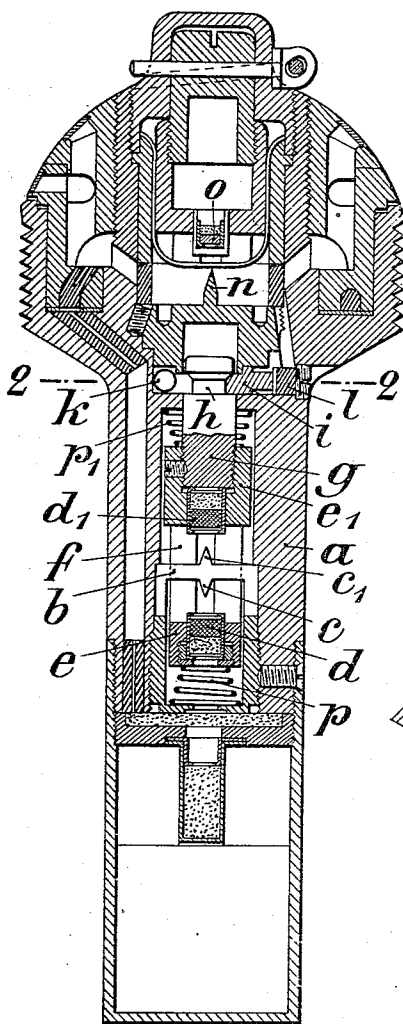


Fig. 2.

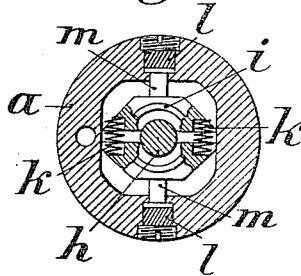
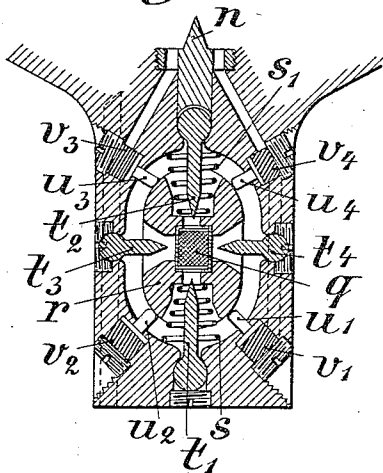


Fig. 3.



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PERCUSSION-FUSE FOR PROJECTILES.

1,046,349.

Specification of Letters Patent.

Patented Dec. 3, 1912.

Application filed August 25, 1911. Serial No. 646,002.

To all whom it may concern:

Be it known that I, KARL VÖLLER, a subject of the German Emperor, residing at 12 Scharnhorststrasse, Dusseldorf, Germany, have invented certain new and useful Improvements in Percussion-Fuses for Projectiles; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

The invention relates to a percussion fuse, designed to act in case the impact should not be made with the point of the projectile, and provided for this purpose with more than one firing pin, pointing in different directions, and corresponding detonators.

According to the invention the firing pins are connected together and held by a safety device, which is released when the gun is fired. In consequence of the connection between the detonators it is not necessary to provide safety devices for every detonator.

The drawing shows the invention applied to a combination fuse for a projectile.

Figure 1 is a longitudinal section of one form of construction. Fig. 2 is a cross section at the line 2—2 of Fig. 1. Fig. 3 is a longitudinal section of a modified construction.

In the constructions according to Figs. 1 and 2 the time fuse is arranged in the front part of the head of the combination fuse, but this part has nothing to do with the present invention and need not be further described. Below this in the body *a* of the combination fuse is the percussion fuse constructed according to the present invention. This consists of a strap *b* screwed into the body of the fuse, having two firing pins *c* and *c'*. These two firing pins are opposite the detonators *d* and *d'*, whose supports *e* and *e'* are connected by the rods *f*, which leave sufficient space between them for the strap *b*. The detonators *e* and *e'* are connected with a bolt *g* having a reduced part *h*. Around this part *h* are locking rings *i* (Figs. 1 and 2), which are pressed outward by springs *k*. In the normal condition the locking rings are prevented from moving outward by spaces *l* filled with powder, against which pistons *m* connected to the locking rings *i* press. In Fig. 1 for the sake of clearness, on one side the locking

ring *i* and on the other side the spring *k* are shown in section, so that at this place the longitudinal section is taken through two planes at right angles. The primers *l* serve as a safety device for the percussion fuse. When the projectile is fired, a detonator *o* (in the present case forming also the detonator of the time fuse) is pierced in consequence of the release of the fuse by the initial impulse, in the example shown through the plunger *n* of the time fuse. The flame produced in this way strikes, after a longer or shorter course, on the powder spaces *l* and the powder consequently burns away during the flight of the projectile. This releases the locking rings, which under the action of the springs *k* and the centrifugal force due to the rotation of the projectile, move outward and free the bolt *g*. This frees the detonators *d* *d'*, which are still held in equilibrium by the springs *p* and *p'*. Owing to the reduction of the speed of the projectile at its impact the detonators are projected forward, and according as the projectile strikes with its forward or after part, either the detonator *d* is forced against the firing pin *c*, or the detonator *d'* against the firing pin *c'*. Consequently the ignition of the fuse is insured in either case.

In the construction according to Fig. 3, the arrangement is such that an ignition is insured even if the impact should be made with the side of the projectile. For this purpose the detonator *q* is placed on the center of a piece *r*, which is kept in equilibrium between two springs *s* and *s'*. This piece is surrounded on all four sides with firing pins *t'*, *t''*, *t'''*, *t''''*, whose points are directed toward the detonator *q*. Before firing, the body *r* is held by the pistons *u'*, *u''*, *u'''*, *u''''* which rest against the powder spaces *v'*, *v''*, *v'''*, *v''''*. The action is the same as in the construction according to Figs. 1 and 2. As soon as, owing to the initial impulse on firing, the time firing pin *n* has pierced the detonator provided for it, the flame strikes through the channels to the powders *v'*, *v''*, *v'''*, *v''''*, which accordingly burn and free the detonator support *r*. On impact the detonator *q* is projected against one of the firing pins *t'*, *t''*, *t'''*, *t''''*, according to the part of the projectile which strikes against the object. In order that the firing pins should not hinder the free movement of the deto-

nator support γ , they are journaled with round ends in the fuse body, so that every firing pin can give in a direction at right angles to the direction of approach of the support γ .

I claim as my invention:

1. In a percussion fuse for projectiles, a plurality of firing pins pointing in different directions, corresponding detonating material normally held in fixed relation to the firing pins, a safety device normally holding the detonating material from engaging with the firing pins, means for releasing the safety device after the gun is fired to permit the detonating material to move relatively to the firing pins, and springs for holding the detonating material in equilibrium after it is released by the safety device.
2. In a percussion fuse for projectiles, a plurality of firing pins pointing in different directions, corresponding detonating material normally held in fixed relation to the firing pins, means connecting the detonating material to form a single detonator, a

safety device normally holding the detonating material from engaging with the firing pins, means for releasing the safety device after the gun is fired to permit the detonating material to move relatively to the firing pins, and springs for holding the detonating material in equilibrium after it is released by the safety device.

3. A percussion fuse having in combination with an initially acting detonator and a firing pin therefor, a movable detonator support and a detonator mounted therein, a plurality of firing pins pointing in different directions, and means normally holding said support out of engagement with the firing pins, said last mentioned means being actuated by the firing of the gun to release said support.

In testimony whereof, I have signed this specification in the presence of two subscribing witnesses.

KARL VÖLLER. [L. s.]

Witnesses:

CHAS. J. WRIGHT,
ALBERT F. NUFER.